

IN THE CLAIMS:

Please cancel Claims 13-15.

Please add Claims 24-33.

24. (New) A method for distinguishing at least two target bio-organic molecules with dyes selected from a pool of at least two dyes, the method comprising:

(a) providing a first set of at least two probes, wherein each probe recognizes a target bio-organic molecule in a first set of target bio-organic molecules, and wherein each probe is distinctly-labelled with primary labels that are distinct from one another due to the presence of dyes in distinct ratios;

(b) providing a second set of probes distinctly-labelled with said primary labels described in step (a), wherein each probe in said second probe set recognizes a target bio-organic molecule in a second set of target bio-organic molecules;

wherein each probe in said first or second probe set is further labelled with the same first binary label, wherein said first binary label is distinct from said primary labels; and

(c) contacting said at least two target bio-organic molecules with said probe sets,

wherein said target bio-organic molecules are distinguished.

25. (New) A method according to Claim 24 further providing an additional probe set distinctly labelled with said primary labels, wherein each probe in said additional probe set recognizes target bio-organic molecule(s) in an additional target set, and wherein each probe in said additional set is further labelled with the same second binary label, wherein said second binary label is distinct from said primary labels and said first binary label.

26. (New) A method according to Claim 24 wherein said primary labels are distinct from one another due to the presence of two dyes in distinct ratios.

27. (New) A method according to Claim 24, wherein at least one of said bio-organic molecules comprises a nucleic acid, protein, carbohydrate and/or lipid.

28. (New) A method according to Claim 24, wherein said pool comprises three dyes.

29. (New) A method according to Claim 24, wherein said labelling comprises nick translation, random primed labelling, PCR-labelling or chemical labelling.

30. (New) A method according to Claim 24 wherein said binary label is a hapten.

31. (New) A method for labelling at least two probes with dyes selected from a pool of at least two dyes, wherein said labelled probes are distinguishable from one another, the method comprising:

(a) distinctly labelling with primary labels a first set of at least two probes, wherein each probe recognizes a target bio-organic molecule in a first set of target bio-organic molecules, and wherein said primary labels are distinct from one another due to the presence of dyes in distinct ratios; and

(b) distinctly labelling a second set of probes with said primary labels described in step (a), wherein each probe in said second probe set recognizes a target bio-organic molecule in a second set of target bio-organic molecules; and

(c) labelling each probe in said first or second probe set with a binary label, wherein said binary label is distinct from said primary labels, and wherein each probe in said first or second set is labelled with the same binary label;

wherein said probes are labelled.

32. (New) A kit for labelling at least two bio-organic molecules, comprising:

(a) a first set of probes wherein each probe in said set recognizes a target bio-organic molecule in a first set of target bio-organic molecules, wherein each probe in said first probe set is distinctly-labelled with primary labels, and wherein said primary labels are distinct from one another due to the presence of dyes in distinct ratios; and

(b) a second set of probes distinctly-labelled as described in step (a), wherein each probe in said second probe set recognizes a target bio-organic molecule in a second set of target bio-organic molecules; and wherein said second probe set is further labelled with a binary label which is distinct from the labels used in step (a).

33. (New) A kit according to Claim 32 further comprising additional set(s) of probes distinctly-labelled with said primary labels, wherein each probe in said additional probe set(s) recognizes target bio-organic molecules in additional target set(s), and wherein said additional probe set(s) are further labelled with binary labels which are distinct from the labels used in Claim 31, and distinct from one another.